

Abstract: International Space Station (ISS) Risk Reduction Activities

As the assembly of the ISS nears completion, it is worthwhile to step back and review some of the actions pursued by the Program in recent years to reduce risk and enhance the safety and health of ISS crewmembers, visitors, and space flight participants. While the ISS requirements and initial design were intended to provide the best practicable levels of safety, it is always possible to reduce risk – given the determination and commitment to do so. The following is a summary of some of the steps taken by the ISS Program Manager, by our International Partners, by hardware and software designers, by operational specialists, and by safety personnel to continuously enhance the safety of the ISS.

While decades of work went into developing the ISS requirements, there are many things in a Program like the ISS that can only be learned through actual operational experience.

These risk reduction activities can be divided into roughly three categories:

- Areas that were initially noncompliant which have subsequently been brought into compliance or near compliance (i.e., Micrometeoroid and Orbital Debris [MMOD] protection, acoustics)
- Areas where initial design requirements were eventually considered inadequate and were subsequently augmented (i.e., Toxicity Level 4 materials, emergency hardware and procedures)
- Areas where risks were initially underestimated, and have subsequently been addressed through additional mitigation (i.e., Extravehicular Activity [EVA] sharp edges, plasma shock hazards)

Due to the hard work and cooperation of many parties working together across the span of nearly a decade, the ISS is now a safer and healthier environment for our crew, in many cases exceeding the risk reduction targets inherent in the intent of the original design. It will provide a safe and stable platform for utilization and discovery.